

TECHNICAL MEMORANDUM

To: Robert Grandinetti, EPA Region 10
From: Wes Ganter, Tom Rowlett, PG Environmental, LLC
Date: 10/22/2014
Subject: Review – Seattle Integrated Plan Draft dated 05/29/2014

PG was tasked by USEPA to review Volume 3 - Integrated Plan (IP) draft dated May 29, 2014, submitted by Seattle Public Utilities. The purpose of PG's review was: (1) to assess general conformance with Paragraph V.B.20 of the SPU Consent Decree filed July 3, 2013, (2) to assess general conformance with applicable USEPA IP guidance documents, and; (3) to determine whether the proposed recommendations presented in the IP are supported by appropriate engineering analyses. To assist in its review, PG also reviewed other key reference documents listed in the IP, as follows:

- Appendices A, C and I of the Integrated Plan
- Referenced Sections of Volume 2 – Long Term Control Plan (LTCP) draft dated May 29, 2014
- Integrated Plan: Stormwater Priority Basins Technical Memorandum, April 9, 2013 (SPU, 2013a)
- Integrated Plan: Stormwater Treatment Project Screening Technical Memorandum April 10, 2013 (SPU, 2013c)
- Integrated Plan: Stormwater Project Selection Process for Further Consideration, May 15, 2013 (SPU, 2013d)
- Expert Panel Comments and Recommendations on the Integrated Plan, dated November 12, 2013
- Integrated Plan: Briefing Memorandum on Stormwater and CSO Project Evaluation and Exposure Assessment Methods. Revised May 23, 2013 (SPU, 2013e)
- U.S. Environmental Protection Agency. "Combined Sewer Overflows Guidance for Screening and Ranking." Document 832-B-95-004. August 1995.
- U.S. Environmental Protection Agency. "Achieving Water Quality Through Integrated Municipal Stormwater and Wastewater Plans." Memorandum October 27, 2011
- U.S. Environmental Protection Agency. "Planning for Sustainability – A Handbook for Water and Wastewater Utilities." Document 832-R-12-001 February 2012
- U.S. Environmental Protection Agency. "Integrated Municipal Stormwater and Wastewater Planning Approach Framework." Memorandum June 5, 2012.

Summary Findings

Based on its review, PG finds:

1. That the IP is in conformance with the (1) Consent Decree requirements contained in Paragraph V.B.20 and (2) the six Elements of USEPA's June 2012 Memorandum "Integrated Municipal Stormwater and Wastewater Planning Approach Framework.
2. That the IP successfully demonstrates that the three stormwater projects proposed for early implementation will likely yield greater water quality and environmental benefits than the six LTCP projects proposed for deferred implementation.

3. That the City developed and applied within the IP a robust methodology and ranking system to evaluate projects for acceleration and deferral.
4. The underlying logic supporting selection of the universe of fourteen stormwater projects and six LTCP projects chosen for evaluation is not well explained within the IP. Specifically, the IP does not demonstrate that: 1) these are the only stormwater and LTCP projects worthy of evaluation; 2) that the three stormwater projects selected for early implementation offer the greatest environmental benefits of the cadre of potential stormwater projects; or, 3) that the six LTCP projects selected for deferral offer the least environmental benefits of the cadre of potential LTCP projects. It also appears that the Street Sweeping Expansion-Residential project should also be included for early implementation.

Specific Findings

Following are PG's individual comments and review questions regarding the IP:

5. Regarding general conformance with USEPA's June 2012 Memorandum "Integrated Municipal Stormwater and Wastewater Planning Approach Framework." (Framework), the IP adequately addresses:
 - a. The overarching principles of the Framework including: measures to protect public health and the environment, prioritization of environmental protection, and application of green infrastructure.
 - b. The six Plan Elements presented in the Framework, including:
 - i. a description of the water quality, human health and regulatory issues to be addressed in the plan (see Chapters 1 and 2)
 - ii. a description of existing wastewater and stormwater systems under consideration and summary information describing the systems' current performance (see Chapter 3)
 - iii. a process which opens and maintains channels of communication with relevant community stakeholders (see Chapter 4)
 - iv. a process for identifying, evaluating, and selecting alternatives and proposing implementation schedules (see Chapters 5, 6, and 9)
 - v. a process for evaluating the performance of projects identified in a plan (see Chapters 7, 8, and 10), and
 - vi. a process for future improvements to the plan (see Chapters 8 and 10).
6. The IP appears to adequately address compliance with the requirements contained in Paragraph V.B.20 of the Consent Decree. Specifically, Volume 3, Appendix A, Table 1, *Regulatory Requirements Crosswalk*, provides a matrix relating specific portions of the IP to the Paragraph V.B.20 requirements. It should be noted that due to resource constraints, PG did not evaluate whether the proposed implementation schedule, as required by V.B.20.c, ensures that all remaining CSO control measures are implemented "as expeditious as possible". A full review of the LTCP, IP, and King County's LTCP would be required to make such an analysis.
7. **IP Summary, Pg S-1, opening paragraph:** The IP indicates that the City of Seattle operates a combined sewer system and a storm sewer system, but does not address its separate sanitary sewers that also serve Seattle. A discussion should be included regarding the presence, location, and

operation of the separate sanitary sewer system, identified environmental impacts, and its inclusion or omission within the IP.

8. **IP Summary Pg S-1, last paragraph:** The last line of this paragraph states: “*LTCP projects with relatively high water quality benefits will not be deferred.*” This statement may be premature in that the City has not as yet finalized the LTCP projects that it will implement. Further, this statement appears highly subjective. What does “relatively high” mean and how would it be determined? Does the City plan to apply the volume and ROCC load reductions, average pollutant load reductions, comparison of EIV’s, MODA results, or some other type of objective scoring to the yet unknown final LTCP projects to assure that only the least environmentally beneficial projects would be deferred. Also see comment 12 below regarding deferral of potentially high performing LTCP projects.
9. **IP Section 2, Pg 2-2, Figure 2-1:** What is the significance of the nineteen CSO outfalls shown on Figure 2-1? The third paragraph of IP Section 3.1 on page 3-2 states: “*the City manages 86 CSOs and the County manages 38 CSOs.*” If the CSO outfalls shown on Figure 2-1 are the remaining outfalls to be addressed by LTCP projects, why doesn’t IP Figure 2-1 match LTCP Figure S-3, which shows 22 CSO outfalls? An explanation or map revision should be provided.
10. **IP Section 3.1, Pg 3-2, last paragraph:** What are the “Henderson projects”? The Henderson CSO basins are not shown on Figure 1-1, but are listed in Table 3-1 on Page 3-3.
11. **IP Section 5.1, Pg 5-1, first paragraph:** This paragraph states: “*The City developed its approach for identifying and ranking candidate LTCP projects for deferral based on the document, Integrated Municipal Stormwater and Wastewater Planning Approach Framework (EPA, 2012) and consultations with the LTCP project team. The City’s approach and results are summarized below (see Volume 2 for additional details).*” This would appear to be extremely challenging since the final list of LTCP projects has apparently not yet been developed. As stated in the last sentence LTCP Section 4.4.4: “*After the comment period and receiving EPA and Ecology comments, additional evaluation (CSO Alternative Analysis Report, Implementation Plan and Financial Plan) will be performed and a preferred LTCP option and detailed LTCP Implementation Plan will be included in the Final LTCP.*” How can the LTCP projects most suited for deferment be selected or analyzed until the list of recommended LTCP projects is finalized?
12. **Section 5.1.1, Pg 5-1, first paragraph:** This paragraph states: “*The City’s Integrated Plan team consulted with the LTCP team in order to identify, score, and rank the candidate LTCP projects. The CSO basins were scored based on seven criteria using site-specific information. The CSO basins were ranked from highest to lowest score and divided into two categories: higher-priority CSO basins and lower-priority CSO basins. In keeping with EPA guidelines, the City selected a group of potential candidates for deferral from the lower-priority CSO basins.*” PG notes that the referenced review and ranking appears to be located in Volume 2, Chapter 2, Figure 2-25 of the LTCP. Upon review of Figure 2-25, CSO basin projects 107, 138, and 140 are selected for deferral even though they are some of the highest performing projects within the 21 “lower priority CSO basins.” In fact, CSO basin 107 is the highest ranking project within the lower priority CSO basins. Additionally, the second paragraph of Section 3.2.2 of the document entitled “*Integrated Plan: Briefing Memorandum on Stormwater and CSO Project Evaluation and Exposure Assessment Methods. Revised May 23, 2013 (SPU, 2013e)*” states that “*SPU identified 10 CSO projects as candidates for deferral under the Integrated Plan*”; however, these projects are not identified and only six projects appear in the IP. Additional rationale appears warranted for inclusion of these projects with the LTCP candidate list. Without further explanation, PG would advise that the City demonstrate that the six projects selected for deferral are the least environmentally beneficial projects, which may require the City to: 1) develop a final list of LTCP projects; 2) then determine the relative environmental benefits of each of these projects; and, 3) then rank the LTCP projects by environmental benefit versus cost to determine which are most suitable for deferral.

13. **Section 5.3.1, Pg 5-4, sentence heading the bullet list:** This sentence states: “*The City’s approach (for identifying candidate stormwater projects) is documented in Appendix C to this Integrated Plan and the following technical memoranda:*” PG reviewed Appendix C and concurs that it presents reasonable scoring criteria regarding relative pollutant loadings for Seattle’s waterways and scoring criteria for ranking individual stormwater projects. Paragraph 5.3.2 reports that four of the initial fourteen stormwater projects were removed from the evaluation process, apparently for reasons other than the scoring criteria in Appendix C. However, neither the IP nor Appendix C present the application of the Appendix C scoring criteria to the cadre of other stormwater projects that may be under consideration by Seattle. Therefore, it is not known whether the ten remaining stormwater projects listed in Table 5-2 that were considered for acceleration are in fact the most environmentally beneficial stormwater projects or whether other projects should also be accelerated.

Additionally, Table 1 of the document entitled: “*Integrated Plan: Stormwater Project Selection Process for Further Consideration, May 15, 2013 (SPU, 2013d)*” lists fifteen potential stormwater projects for evaluation, as opposed to fourteen projects mentioned in the IP. There is no explanation of how these projects were selected or if other projects were available for consideration. Of the fifteen projects listed in Table 1 of the referenced document, four stormwater projects found to be cost-effective in reducing TSS were not included for further consideration in the IP. These four projects appear to be significantly more cost-effective than the NDS Partnering project selected for early implementation. The reasons for excluding these four projects from consideration are unclear. One additional project listed Table 1 was not considered in the IP. However, that project has highest cost for removal of TSS of any of the fifteen projects listed which, appears to be adequate justification for exclusion from further consideration. Ultimately, additional explanation, and possibly a reanalysis using a larger universe of projects, should be provided.

14. **Chapter 6:** PG concurs that the “Methods for Evaluation of the Candidate Projects” presented in Chapter 6 of the IP are reasonable for evaluation of the relative environmental merits of the eight stormwater projects and six LTCP projects chosen for evaluation.
15. **Chapter 7:** PG concurs that the various figures presented in this Chapter demonstrate the relative environmental effects of the ten stormwater projects and six LTCP projects through application of the various criteria presented in Chapter 6.
16. **Section 8.2.2, Pg 8-7 & 8-8, Table 8-2 and Figure 8-3:** This Table and Figure shows that six of ten stormwater projects provide higher (better) ecological exposure index values (EIV’s) than the most beneficial of the LTCP projects. In particular, three projects, No. 1 – NDS Partnering: Thorton Creek, No. 2 – South Park WQ Facility, and No. 3 – Piper’s Cascades, provide substantially higher EIV’s than the other stormwater projects and all of the LTCP projects. Two of these projects, No. 1 – NDS Partnering: Thorton Creek and No. 2 – South Park WQ Facility, are included among the stormwater projects recommended for early implementation. By the information provided in Section 8.4.1.1, it appears that the NDS Partnering effort is being expanded to include Pipers Creek and Longfellow Creek, even though these projects scored lower than the Piper’s Cascades project. The City should explain this expansion in lieu of implementing either the Piper’s Creek project or the Street Sweeping Expansion-Residential project.
17. **Section 8.2.3 Pg 8-8:** The first paragraph of this section indicates that EIV’s were not developed for the Street Sweeping Expansion-Arterial project and the Street Sweeping Expansion-Residential project, because EIV’s are related to the discharges at individual outfalls; whereas, these Street Sweeping projects would affect large numbers of outfalls. However, the second paragraph of Section 8.2.3 concludes that Street Sweeping would provide for much larger reductions in PCB’s than the LTCP projects and that PCBs were the predominant factor in determining EIV’s for the other stormwater projects. Additionally, the IP proposes early implementation only for the Street Sweeping

Expansion-Arterial project, however, Figure 8-1 appears to indicate that the Street Sweeping Expansion-Residential project would provide greater total load reductions (and lower rank) than the Street Sweeping-Arterials project. The City should explain: 1) why both Street Sweeping projects are not proposed for early implementation; and, 2) if only one Street Sweeping Expansion project can be implemented, why is the Arterial project placed ahead of the Residential project as per Table 5-2, both seem to have approximately the same number of curb miles for sweeping.

18. **Section 8.3, Pg 8-8:** The City should provide additional discussion and rationale regarding its statement *“The pollutant loads modeling and exposure assessments described above indicated that multiple combinations of the candidate stormwater projects and programs could provide significantly greater water quality benefits than the six candidate LTCP projects combined. The City therefore decided that the Integrated Plan should include all six of the candidate LTCP projects.”* Based, on this statement the inclusion of the six LTCP projects within the IP is unclear.
19. **Section 8.3.5, Pg 8-12, Figure 8-4:** Figure 8-4 presents the MODA scores for the ten stormwater projects considered for acceleration. Based this information, it appears that the Expansion of Residential Street Sweeping effort should be implemented before, or in addition to, the NDS Partnering effort, primarily because of its benefits to water quality. PG recommends that MODA scores also be developed for the six LTCP projects being evaluated and those scores be added to Figure 8-4 for comparison.
20. **Section 8.4, Pg 8-12:** This section states that the City decided that three stormwater and six LTCP projects should be included in the IP. While it is acknowledged that development of the IP and its projects are voluntary, the City should provide additional rationale as to why only three of the stormwater projects were selected for implementation, especially when the ranking process clearly demonstrates that several of the excluded stormwater projects rank higher than the candidate LTCP projects. At a minimum, the IP should refer readers to Section 8.4.5 for additional detail. Additionally, the City should provide additional rationale regarding the decision to ignore its ranking process by selecting the NDS partnering project instead of the higher ranking Street Sweeping Expanded Residential project.
21. **Section 8.4.4.3, Pg 8-28, Table 8-9:** Table 8-9 appears to present the aggregate pollution reduction costs for the three stormwater projects recommended for acceleration and the six LTCP projects recommended for deferral. Table 8-9 attempts to demonstrate that the stormwater projects are more cost-effective than the LTCP projects in reducing pollutant discharges (measured as \$/kg load reduction/yr). This may be correct, but the actual cost-benefit of the individual stormwater and LTCP projects may be masked due to the exclusion of select projects. PG recommends that this Table be expanded to include pollutant reduction costs for each of the ten stormwater projects and six LTCP projects so that the cost-benefit merits of each of these projects can be assessed and IP recommendation adjusted, if necessary.
22. **Chapter 10:** This Chapter presents the post-construction monitoring programs for the various projects proposed in the IP. These programs appear to be adequate to assess the performance of these projects. The Chapter also briefly touches upon the remedial actions that might be taken if initial implementation does not meet anticipated performance objectives, particularly with regard to the NDS Partnering and Street Sweeping. In keeping with Element 6 of USEPA’s “Integrated Municipal Stormwater and Wastewater Planning Approach Framework,” PG recommends that the discussions of potential remedial actions for under-performing stormwater or LTCP projects be expanded to provide more detail regarding planned performance evaluations and possible resulting actions implemented to achieve target performance objectives, including but not limited to, processes for modifying post-construction designs and/or operational procedures.